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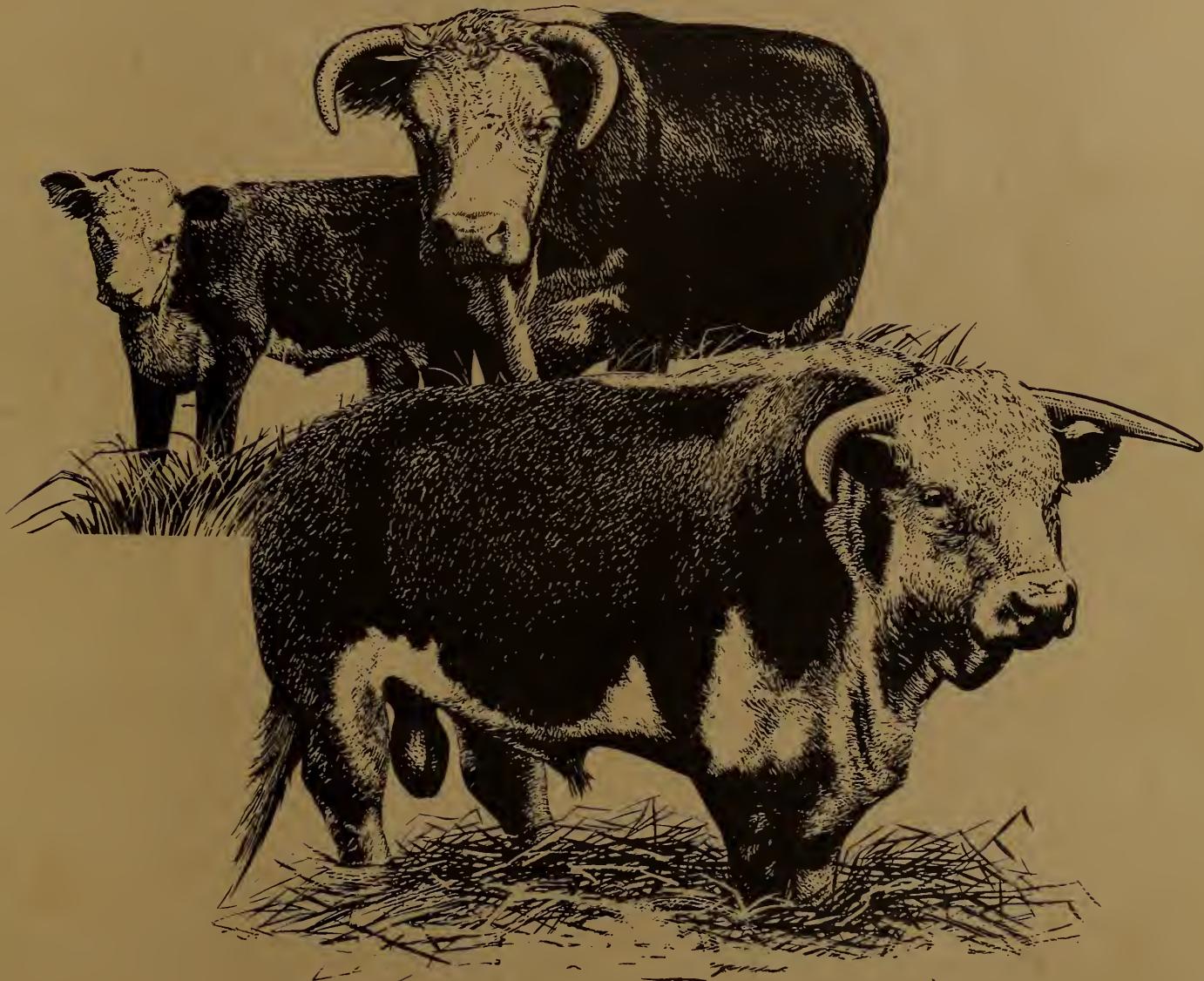
Technical
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Slaughter
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A Study on the New Cattle Post-Mortem Inspection Procedure for Cows and Bulls

K. M. Wesson, DVM



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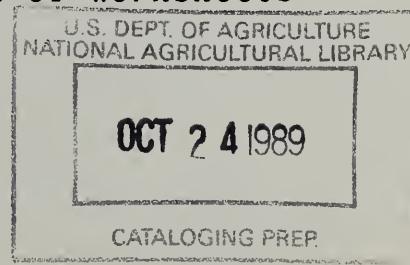
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U.S. Department of Agriculture
National Agricultural Library
Lenting Branch
Beltsville, Maryland 20705

STUDY TEAM

Project Manager

Dr. Karen Wesson
Branch Chief, MPITS, SISP

Task Force

Mathematics/Statistics
SpecialistMs. Pat Abraham
Mathematical Statistician, SCI, MSPost-Mortem Inspection
SpecialistDr. Harry Beauman
Area Supervisor, MPIO, WDr. H. C. Hairston
Staff Officer, MPIODr. Judy Biechler
Supervisory Veterinary Medical
Officer, MPIO, NCMr. Don Hunter
Food Inspector, MPIO, SWPathology/Epidemiology
SpecialistDr. Robert Turnquest
Staff Officer, SCI, PELabor Management Relations
SpecialistMr. James Stokes
Staff Officer, AM, LMR

Work Standards Specialist

Mr. John Wu
Industrial Engineer, MPITS, IEDMPlant Facilities/Equipment
SpecialistDr. Larry Skinner
Branch Chief, MPITS, FESD

Program Training Specialist

Dr. Bob Boschert
Staff Officer, MPITS, PT

Inplant Test Team

Project Officer in Charge

Dr. Judy Biechler
Supervisory Veterinary Medical
Officer, MPIO, NCPost-Mortem Inspection
EvaluatorsDr. Cord Schilmoeller
Supervisory Veterinary Medical
Officer, MPIO, WDr. Abe Trinidad
Supervisory Veterinary Medical
Officer, MPIO, W

Dr. Gail Wincey
Supervisory Veterinary Medical
Officer, MPIO, W

Dr. Jan Leder
Supervisory Veterinary Medical
Officer, MPIO, SE

Dr. Jerry Schafer
Circuit Supervisor, MPIO, SW

Dr. Kurt Bretz
Supervisory Veterinary Medical
Officer, MPIO, NE

Mr. Bob Penniman
Food Inspector, MPIO, NC

Ms. Dawn Squires
Food Inspector, MPIO, W

Mr. Wayne Wheeler
Food Inspector, MPIO, SW

Ms. Lavonne Terry
Food Inspector, MPIO, SW

Mr. Luther Cotton
Food Inspector, MPIO, NC

SUMMARY

The effectiveness of the new cattle post-mortem inspection procedure was tested in two establishments slaughtering cows and bulls. This new inspection procedure was equally effective as the traditional procedure. The staffing standard, based on work measurement studies, shows that this new inspection procedure will result in increased inspection productivity.

The final staffing standard contained in this report includes incision of the medial masticatory muscles. This was eliminated in the original proposed procedure, but was reinstated because of the public health significance of cysticercosis. More extensive testing is needed before elimination of incision of the medial masticatory muscles. This incision is made to detect the presence of cysticercosis.

Implementation of this new inspection procedure, modified to include the incision of the medial masticatory muscles, is recommended. It would be desirable that effective reinspection procedures for beef tongues and carcasses be implemented concurrently with this new procedure.

Additional work measurement studies will be conducted based on various slaughter rates (cattle per hour) for the purpose of establishing the final work measurement standard. In addition, future work measurement studies will be conducted to determine staffing standards for those establishments operating at rates less than 57 head per hour where one or two inspectors are currently assigned.

I. OBJECTIVE

The objective of this study was to compare the effectiveness of a new cattle post-mortem inspection procedure with the traditional procedure as outlined in the Meat and Poultry Inspection (MPI) Manual.

II. PROBLEM

The Federal Meat and Poultry Inspection Acts require that an inspector perform a post-mortem inspection of each poultry and livestock carcass. For each species, inspectors use a specific routine inspection procedure to detect signs of disease and other unwholesome conditions.

Routine cattle inspection, traditionally, has had three phases to it: head inspection, viscera inspection, and carcass inspection. During each of these phases an inspector performs a sequence of observing, palpating, and, in the case of head and viscera inspection, incising tissues. These procedures, which are outlined in the MPI Manual, have proven to be a workable and effective method of inspection.

New methods of inspection that will increase inspector productivity without sacrificing the quality of inspection must be developed. The proposed procedure for inspection may offer such a method. It differs from the current inspection method in that it:

1. Combines carcass inspection with viscera inspection, thus reducing the inspection stations in many plants from three to two.
2. Eliminates the need for the inspector to observe, palpate, and/or incise certain tissues at both the head and viscera inspection stations.
3. Requires establishments to:
 - a. Provide an employee to palpate tongues. The employee will be responsible for notifying the MPI inspector if abnormalities are found in the tongue.
 - b. Remove kidneys from their capsules for presentation at the viscera station.
 - c. Remove dressing defects and minor conditions (small bruises, minor adhesions, etc.) which will be verified by a reinspection program rather than an inspector at the carcass station.

III. METHODOLOGY

In general, the number of inspectors assigned to cattle post-mortem inspection at a plant is related to the size of the plant and the speed of operation. In small plants with slow slaughter rates, one inspector may complete all inspection procedures (head, viscera, and carcass) on each carcass. In larger plants with faster slaughter rates, there may be one or

more inspectors at each of the three inspection sites or stations (head, viscera, and carcass).

The study was conducted at two cow/bull slaughter plants. Both plants in this study had three inspection stations. The original intention was to test the procedure in only one plant. However, the low incidence of pathology at the first plant reflected a need to run another test in a plant with more pathology. Because of the large number of samples needed for the study, the first selection was a high speed mechanized plant. This plant was No. 6 in the rank order of the top thirty mechanized plants ranked from highest to lowest in pathology/1000 slaughtered with line speeds of 60/hr or more. The testing revealed that high speed mechanized cow/bull kills tend to slaughter better than average cattle in order to keep the chain running smoothly. This results in a lower incidence of pathology than is desirable to assure that the new procedure can detect representative pathology found in cow/bull abattoirs nationwide. The second plant selected had a nonmechanized dressing system and was chosen for it's higher incidence of pathology.

A. Head Inspection

There are several established methods of presenting cattle heads for inspection to accommodate the different designs of cattle slaughter plants. The heads may be presented on a stationary stand (head rack) or on a moving chain. In addition, the heads may be presented with the tongues left in the heads

(tongue-in presentation), or the heads may be presented with the tongues removed and placed on hooks beside the heads (tongue-out presentation).

In both plants tested, the heads were presented on a moving chain with a tongue-out presentation. Plants with this type of presentation were selected to facilitate testing methods.

The traditional head inspection procedures consist of the following four steps (order may be changed depending on type of presentation):

1. Observe head's surfaces and eyes.
2. Incise and observe mandibular, parotid, atlantal (lateral retropharyngeal) and suprapharyngeal (medial retropharyngeal) nodes.
3. Incise and observe lateral and medial masticatory muscles (cheeks).
4. Observe and palpate tongue.

The new head inspection procedure that was tested in the study differs from the traditional procedure in that it:

1. Eliminates the requirements to incise the atlantal nodes. Observation of the nodes will still be required.
2. Eliminates the requirement to incise and observe the cut surface of the medial masticatory muscles. The

primary purpose for incising and observing these cut surfaces is to detect cysticercosis and eosinophilic myositis lesions. C. J. McCool's cysticercosis work, published in the Australian Veterinary Journal in 1979, and the cattle pathology survey (FSIS, August 1980) indicate that more muscle lesions are found in the lateral masseter muscles than in the medial masseter muscle. In addition to the medial masticatory muscles, lesions are also found in other muscles that are inspected as part of the new procedure's routine. These muscles include the lateral masticatory muscles (which have a much larger surface area than the medial masticatory muscles), the heart, the external abdominal muscles, and the esophagus.

3. Eliminates the routine requirement of the inspector to palpate tongue; although, observation of the tongue will be a part of the new procedure's routine. Most tongue lesions can be detected by merely observing the tongue. Palpation of the tongue rarely reveals any lesions or conditions that would indicate that the animal is suffering from a systemic disease. Localized conditions, if detected after the tongue has lost identity with the carcass, may be condemned without further action being required on the corresponding carcass. If the carcass is retained for any reason, the head and tongue will be available for final veterinary disposition, as with the traditional system. An establishment employee will be

required to palpate each tongue for deep-seated abnormalities prior to, or at, the inspection station and to notify the cervical inspector if abnormalities are found. The cervical inspector will determine the significance of the abnormalities and take the necessary action. The effectiveness of tongue inspection should be verified by a reinspection procedure before the tongues are chilled.

B. Viscera Inspection

In mechanized plants, after the carcass is eviscerated it continues on the moving rail to the viscera inspection station. In non-mechanized plants, the carcass is moved manually to the viscera inspection station, where it is eviscerated on to manually transported viscera trucks. In the new procedure, the viscera inspector observes all the outside surfaces of the carcass and inspects the viscera. In the traditional procedure, only the ventral surface of the carcass is readily observable to the viscera inspector. Both procedures require observation of the internal surfaces of the carcass. Observation of the carcass at the viscera station will reveal any conditions that require the inspector to retain the carcass and viscera for veterinary disposition or for trim of contamination.

After the inspector observes a carcass, he or she immediately inspects the viscera from the carcass. Cattle viscera are presented for inspection by either of two methods--in a viscera truck or on a moving table. The viscera were presented

on a moving table at the first plant and in a viscera truck at the second plant in the study.

The traditional viscera inspection procedure requires the:

1. Observation of:

- a. Mesenteric nodes
- b. Abdominal viscera
- c. Esophagus and spleen
- d. Ventral surface of lungs

2. Observation and palpation of:

- a. Ruminoreticular junction
- b. Costal surfaces of lungs
- c. Surfaces of liver

3. Incision and observation of:

- a. Bronchial (tracheobronchial) and mediastinal lymph nodes
- b. Heart
- c. Hepatic nodes
- d. Bile duct

The new viscera inspection procedure differs from the current procedure in that it:

1. Eliminates the requirement to observe the ventral surfaces of the lungs. The new procedure does require that the dorsal (costal) surfaces of the lungs be observed and palpated. This action, along with the incision of the mediastinal and left bronchial (tracheobronchial) nodes, is adequate for detection of lung pathology.
2. Eliminates the requirement to incise and observe the right bronchial (tracheobronchial) node. According to Sisson and Grossman, this node is present in only 25 percent of cattle carcasses. 1/
3. Eliminates the requirement to incise the hepatic nodes. The new procedure requires observation of these nodes.
4. Eliminates the requirement to palpate the ruminoreticular junction. The new procedure requires observation of this area.

The new procedures move the carcass inspection responsibilities from the carcass station to the viscera station, thus eliminating the carcass station. With this move, some of the steps in the traditional carcass inspection procedures have been eliminated, while others have been modified and added to the viscera inspector's responsibilities. The following have been eliminated:

1/ Robert Getty, Sisson and Grossman's The Anatomy of the Domestic Animal, Vol. 1, p. 1033 (Philadelphia: Saunders, 1975).

- * The requirement to palpate the diaphragm and the supramammary and internal iliac lymph nodes. The new procedures, however, do include the observation of the diaphragm and these nodes.
- * The requirement to observe the spinal column and surrounding tissues. The 1980 FSIS cattle pathology survey shows that very little primary pathology is observed in these tissues. Secondary pathology in the spine can be identified during expanded veterinary examination because the line inspector should "rail out" the carcass upon detection of the primary lesion.

The following requirements have been added to the viscera inspector's responsibilities:

- * The requirement to observe the thoracic, peritoneal, and pelvic cavities. This means that the viscera inspector may, on occasion, grasp both sides of the carcass's ventral midline and spread the opening so these cavities may be more closely observed. To facilitate this observation, shadow-free lighting with a minimum Color Rendering Index (CRI) of 62 would be required at each inspection station. Spotlights directed inside the unsplit carcass are already in use in many plants.
- * The requirement to observe the dorsal surfaces of the carcass. Placement of a mirror and adequate lighting at the viscera station in a position behind the moving carcasses will enable the inspector to easily view the

dorsal surfaces. Mirrors and appropriate lighting will be supplied by the establishment.

* The requirement to observe all surfaces of the kidney.

Kidney palpation will no longer be required.

A complete list of the steps in the traditional procedures, as well as a complete list of steps in the new procedures, may be found in Appendix C.

C. Design and Sampling Plan

One week before the study at each plant, two trainers (a training division officer and a food inspector) were at the plant to teach the inspectors the new procedures. During this week, the inspectors rotated inspection stations (head, viscera, and carcass) to become accustomed to doing the new procedures at each inspection position. Also during the week of training, the establishment employees assigned to palpate tongues received training so that they were able to detect those abnormalities that could be trimmed and those that required notification of the inspector.

After the week of training was completed, a pilot study was conducted at each plant. This allowed everyone (inplant inspectors and testing team) participating in the study to adjust to the testing process and the project officer in charge to make any changes before the actual test study began. Data collected during the pilot study were not included in the report.

Following the pilot study, the actual test study began. The test in the mechanized plant lasted approximately six days. The non-mechanized plant test lasted approximately 12 days. During that time the evaluators selected and evaluated 7,200 samples (3,600 that received traditional inspection and 3,600 that received new inspection) and recorded their results on worksheets. The samples were selected and evaluated at approximately the same four locations in each of the two test plants.

These locations (evaluation sites) were as follows:

The carcass was evaluated at two different sites (Site #3, after the viscera station, and Site #4, after the carcass station). The carcass was evaluated at Site #3 to determine which procedure (traditional or new) was more effective in detecting conditions that required carcass retention for veterinary disposition. Evaluating the carcass at this site is important because the viscera must be retained with the carcass for veterinary disposition. Since carcasses being inspected under the new procedures would not be inspected after the viscera station, evaluating the carcass at Site #3 would indicate if the inspectors using the new procedures at the viscera station were able to detect those carcasses that must be retained for veterinary disposition.

All samples at each of the four evaluation sites were selected in the following manner. The evaluators selected the first available unit (carcass, head, tongue, etc.) as it went by

the evaluation site. The evaluators examined the unit, noted the identification code, and recorded the errors on the appropriate worksheet. After this was done, the evaluators selected the first available unit with the opposite identification code, examined it, and recorded the findings on the appropriate worksheet. This alternate selection continued until the required number of units were evaluated.

To reduce possible bias because of variability of pathology and dressing errors in different lots, the test was designed so that the traditional and new procedures were evaluated simultaneously. During the test, each unit was marked with an identification code. This was done to assure that the appropriate procedure (traditional or new) was used on each unit. Carcasses, heads, and tongues that were to be inspected with traditional procedures were marked with one code, and those that were to be inspected with new procedures were marked with another code. The codes were changed on a random basis and were known only by the project officer in charge.

The evaluators examined heads, tongues, viscera, and carcasses for pathologic lesions and dressing errors that warranted retention. The only exception to this was that carcasses were not evaluated for dressing defects and certain minor conditions (small bruises, minor adhesions, etc.) at the viscera carcass evaluation site. Evaluation for the removal of these defects and conditions at this evaluation site would have no purpose since these defects and conditions were removed by plant trimmers down the line from this site. Each lesion or

error missed by inspectors was recorded and tallied on the worksheet (Appendix D) according to the instructions provided (Appendix E).

D. Testing

The number of inspectors and the inspection configuration varied because of the different line speeds at the two test plants. The mechanized plant had 5 inspectors (2 head inspectors, 2 viscera inspectors, and 1 carcass inspector--high rail and low rail). The non-mechanized plant had 2 inspectors (1 head and high rail carcass, and 1 viscera and low rail carcass).

Testing was done as follows:

Evaluation #1: Head and tongue evaluations.

Both of these evaluations were done at a site immediately downline from the head station. Before each evaluation, the head inspectors were divided into two groups. One group used the traditional procedures, and the other group used the new procedures. The heads were identified with a marking code and the code was given to the inspectors. The heads and tongues that were identified with the traditional procedure's code were inspected by the inspectors using the traditional procedures and the heads identified with the new procedure's code were inspected by the inspectors using the new procedures. In the smaller non-mechanized plant, the single head inspector alternated between

traditional and new procedures by inspecting according to the marking code for that particular test.

After the heads and tongues were inspected, they were examined on the line by two veterinary evaluators who were standing down the line from the head inspection station. When necessary, a test team presenter made additional cuts and/or arranged organs so that the inspected organs, etc., from both procedures looked the same. This prevented the evaluators from knowing which procedure they were evaluating. In addition, a third member of the test team was available at each evaluation site to look at questionable lesions so that a more accurate diagnosis could be made. The evaluators had the option of retaining heads and tongues for closer examination when necessary. Results of the evaluators' findings were recorded on Worksheet Nos. 1 and 2 by a recorder who was standing next to the evaluators.

To prevent bias, a shield was placed between the evaluators and the inspectors so that the evaluators were not able to see which inspection procedures they were evaluating (Appendix F, Illustration 1). Also, the evaluators were not given the marking codes that identified the type of procedures used on the heads and tongues. They were instructed to randomly select and evaluate 100 heads and tongues marked with each code.

Evaluation #2: Viscera evaluation.

The viscera inspectors, like the head inspectors, were divided into two groups. One used the traditional procedures to

inspect the viscera (and carcasses) identified with the traditional procedure code; the other group used the new procedures to inspect the viscera and carcasses identified with the new procedures code. In the small non-mechanized plant the single viscera inspector alternated between traditional and new procedures by inspecting according to the marking code for that particular test.

Sets of viscera were identified by matching the viscera to the code markings on the carcasses; therefore, the evaluators who were standing behind a shield (Appendix F, Illustration 2), did not know which procedures were being used on the viscera they were evaluating. When necessary, a test team presenter made additional cuts and/or arranged organs so that the inspected organs going to the evaluator appeared to be identical. The evaluators selected and evaluated 100 sets of viscera inspected under the traditional procedures and 100 sets of viscera inspected under new procedures. Results were recorded on Worksheet Nos. 3 and 4.

Evaluation #3: Viscera-Carcass evaluation.

The arrangement of the inspectors at the viscera station and at the head station for evaluation #3 was the same as described under evaluations #1 and #2). The evaluators were positioned downline from the inspectors, and separated from the inspectors by a shield. (Appendix F, Illustration #3). One evaluator examined the ventral surfaces of the carcasses, as well as the pelvic, peritoneal, and pleural cavities. Another evaluator

examined the dorsal surfaces of the carcasses. One hundred carcasses that received the traditional inspection procedures and 100 that received the new inspection procedures were examined to determine if the viscera inspectors missed any carcass conditions that would require the carcass and its viscera to be retained for veterinary disposition or for carcass trim of localized pathologic conditions (abscesses, arthritis, extensive bruises, etc.). Dressing defects, except for excessive contamination which would be spread in the carcass splitting process were not examined because plant trimmers removed dressing defects down the line from this site. Results were recorded on Worksheet No. 5.

Evaluation #4: Carcass evaluation.

The arrangement of the inspectors at the viscera station and at the head station was the same for evaluation #4 as that described under evaluations #1 and #2. The carcass station was manned by an inspector who was using the traditional carcass inspection procedures. Only those carcasses that were marked with the traditional procedure code were inspected. The carcasses marked with the new inspection code received no inspection at the carcass station; however, dressing defects and minor conditions (small bruises, minor adhesions, etc.) were removed by plant trimmers. The carcass evaluation site located between the carcass station and the carcass wash was separated from the inspectors by a shield. (Appendix F, Illustration #4). The evaluators selected and evaluated 100 carcasses that received the traditional procedures and 100 carcasses that received the new procedures. Results were recorded on Worksheet No. 6.

After the six evaluations (head, tongues, livers, remaining viscera, viscera-carcass, and carcass) were made, the evaluators repeated the same sequence of setting up the shield at each evaluation site, selecting and evaluating 100 additional samples that received traditional inspection and 100 additional samples that received new inspection. This sequence continued until the total number of samples required by the test were selected and evaluated.

E. Variability/Bias

To prevent or reduce variability and bias, the following steps were taken.

1. Assignments were made so that during the test, inspectors rotated stations. Each inspector had a turn at using both the new and traditional inspection procedures at each station.
2. During the test the same procedure, traditional or new, was used on each carcass (and the head and viscera from that carcass) at each station.
3. The evaluators alternated duties at each evaluation site so that each one served as an evaluator and then as a recorder. Evaluations were made only by veterinarians. Some recordings were made by food inspectors from the test team.
4. The traditional and new procedures were evaluated simultaneously, and carcasses of animals from the same

lots were used for both procedures.

5. A shield was placed between evaluators and inspectors.
6. The marking codes identifying the traditional and new procedures were not revealed to the evaluators.
7. The new viscera inspection procedures require the kidneys to be removed from the carcass, stripped of their capsule, and presented for inspection along with the rest of the viscera on the viscera table. However, during viscera evaluation and viscera-carcass evaluation, the kidneys from all carcasses were presented this way.* This prevented the evaluators from looking at the carcasses and determining which carcasses received the traditional procedures and which received the new procedures.
8. The new head inspection procedure does not include the incision of the atlantal nodes or the incision and observation of the medial masticatory muscles. The hepatic nodes and the right bronchial node were not incised and the lungs were not turned over by the viscera inspectors using the new procedures. To prevent the evaluators from identifying which procedure (traditional or new) was used, those tissues (nodes and

* During testing and evaluation this gave a relative advantage to the traditional procedures because kidneys are normally not exposed and inspected at the viscera station during traditional procedures.

masticatory muscles) not incised by the inspector using the proposed procedures were incised and the viscera positioned so that all heads and viscera presented to the evaluators looked the same.

The individuals performing these tasks were located next to the head and viscera inspectors and close to the shield so that they could not be observed by the evaluators.

F. Backup Inspection

To assure that product inspected by the proposed procedures met the standards for wholesomeness, all heads, viscera, and carcasses examined by the new procedures, but not yet examined by the evaluators during testing, received an additional inspection which included the traditional procedures that were omitted. Additional inspection prevented the evaluators from identifying which product was inspected under the new procedures.

IV. RESULTS AND STATISTICAL ANALYSIS

The Mathematics and Statistics Division analyzed the data collected during the study. The test results from the two plants are summarized in Table 1, Summary of Test Results, which shows: evaluation site, units evaluated, plant number, units free of errors, and percent accuracy for traditional and new procedures. The percent accuracy and confidence interval by evaluation site and type of errors are listed in Table 2, Percent Accuracy and Confidence Interval (CI).

This table includes:

Column 1 - Evaluation sites

Column 2 - Total number of samples evaluated in the two plants

Column 3 - Plant numbers

Column 4 - Number of samples evaluated from the traditional procedures with no errors

Column 5 - Percent of samples evaluated that were free from errors (column 4 divided by column 2) on the traditional procedures

Column 6 - The 95 percent confidence interval on the percent of samples evaluated that were free from errors on traditional procedures

Column 7 - Number of samples evaluated from the new procedures with no errors

Column 8 - Percent of samples evaluated that were free from errors (column 7 divided by column 2) on the new procedures

Column 9 - The 95 percent confidence interval on the percent of samples evaluated that were free from errors on the new procedures

A percent confidence interval is listed for each percentage.

It is expected that the true number of error-free units for these two plants is contained in that interval. If the intervals overlap, there is no evidence of a difference in error rates.

TABLE 1. SUMMARY OF TEST RESULTS (Two-Plant Summary)

SITE	# SAMPLES	PLANT #	Traditional			New		
			# WITH NO ERRORS	% WITH NO ERRORS	95% CI	# WITH NO ERRORS	% WITH NO ERRORS	95% CI
Head	600	1	467	77.8		454	75.7	
	600	2	523	87.1		520	86.6	
Total	1200		990	82.5	80.4, 84.6	974	81.2	79.0, 83.4
Tongue	600	1	516	86.0		506	84.3	
	600	2	517	86.1		519	86.5	
Total	1200		1033	86.1	84.1, 88.1	1025	85.4	83.4, 87.4
Visc-Visc	600	1	525	87.5		545	90.8	
	600	2	583	97.1		589	98.1	
Total	1200		1108	92.3	90.8, 93.8	1134	94.5	93.2, 95.8
Liver	600	1	576	96.0		565	94.2	
	600	2	597	99.5		594	98.9	
Total	1200		1173	97.8	97.0, 98.6	1159	96.6	95.6, 97.6
Visc-Carc	600	1	591	98.5		585	97.5	
	600	2	589	98.1		592	98.6	
Total	1200		1180	98.3	97.6, 99.0	1177	98.1	97.3, 98.9
Carcass	600	1	195	32.5		173	28.8	
	600	2	466	77.7		462	76.9	
Total	1200		661	55.1	52.3, 57.9	635	52.9	50.1, 55.7

TABLE 2. PERCENT ACCURACY AND CONFIDENCE INTERVAL (CI)
(Two-Plant Summary)

SITE	# SAMPLES EVALUATED	ERROR TYPE	Traditional			New		
			SAMPLES W/ NO ERRORS		95% CI	SAMPLES W/ NO ERRORS		95% CI
			TOTAL	%		TOTAL	%	
Head	1200	Path	1199	99.9	99.7, 100	1200	100	79.0, 83.4
	1200	Dress	990	82.5	80.4, 84.6	974	81.2	
	Total		990	82.5	80.4, 84.6	974	81.2	
Tongue	1200	Path	1113	92.8	91.3, 94.3	1101	91.8	90.2, 93.4
	1200	Dress	1114	92.8	91.3, 94.3	1120	93.3	91.9, 94.7
	Total		1033	86.1	84.1, 88.1	1025	85.4	83.4, 87.4
Visc-Visc	1200	Path	1114	92.8	91.3, 94.3	1137	94.8	93.5, 96.1
	1200	Dress	1194	99.5	99.1, 99.9	1196	99.7	99.4, 100
	Total		1108	92.3	90.8, 93.8	1134	94.5	93.2, 95.8
Liver	1200	Path	1178	98.2	97.4, 99.0	1164	97.0	96.0, 98.0
	1200	Dress	1196	99.7	99.4, 100	1195	99.6	99.2, 100
	Total		1173	97.8	97.0, 98.6	1159	96.6	95.6, 97.6
Visc-Carc	1200	Path	1185	98.8	98.2, 99.4	1184	98.7	98.1, 99.3
	1200	Dress	1195	99.6	99.2, 100	1193	99.4	98.9, 99.5
	Total		1180	98.3	97.6, 99.0	1177	98.1	97.3, 98.9
Carcass	1200	Path	1118	93.2	91.8, 94.6	1109	92.4	90.9, 93.9
	1200	Dress	702	58.5	55.7, 61.3	681	56.8	54.0, 59.6
	Total		661	55.1	52.3, 57.9	635	52.9	50.1, 55.7

TABLE 3. TWO-PLANT SUMMARY (Kidneys)

PLANT	NEPHRITIS/ PYELITIS	CYSTS	ABSCESSES	NEOPLASMS	OTHER	TOTAL	
TRADITIONAL							
1	8	69	0	0	15	92	84.4% Error free (82.3, 86.5)
2	14	57	0	0	24		
TOTAL	22	126	0	0	39	187	
NEW							
1	2	52	0	0	3	57	89.8% Error free (88.1, 91.5)
2	15	30	0	0	21		
TOTAL	17	82	0	0	24	123	

All intervals overlap for dressing, pathological, and total errors. In all others cases, no difference was detected between the two procedures.

Table 3 Lists the kidney errors, by type, for each plant. The percent of error-free units and the 95 percent confidence interval are given in the right margin.

V. Limitations

1. The plants sampled in this study were not randomly selected. They were selected on the basis of several factors mainly: (1) adequate facilities to position evaluators at evaluation sites, (2) available lighting and platforms at the sites, (3) chain speed and daily slaughter adequate to sample and evaluate the required number of units, (4) plant management's cooperation, and (5) incidence of pathology. Inferences can be made only to the plants selected. Inferences to other plants are judgmental.
2. The line speed at each plant was at the normal operating line speed. Both plants were fully staffed.
3. The new method of inspection was used during the week of familiarization as compared to the traditional inspection procedure. The fact that the inspectors were more familiar with the traditional procedures gave an advantage to the effectiveness data for the traditional

method. The effectiveness data from the new procedures was limited by the inspectors brief training period.

4. When a carcass (viscera/head) was tagged, it was assumed that the inspector noted all lesions and dressing defects for which the carcass (viscera/head) should have been tagged.
5. At each plant, because of the large number of samples needed, three of the evaluations (heads, tongues, and viscera-carcass) were combined and done simultaneously. The other three evaluations (liver, remaining viscera, and carcass) were also combined and done at the same time.

VI. RECOMMENDATIONS

The task force agreed that the test data confirmed that the new procedure for cows and bulls was as effective as the traditional procedure. Work measurement studies showed that the new procedure would result in more efficient utilization of inspection personnel.

Although the testing showed that elimination of the incision of the medial masticatory muscles did not adversely affect the effectiveness of the new procedure, the task force recommended that further testing and data collection be done prior to the elimination of this inspection element. Cysticercosis, which may be identified by this incision, occurs rarely in the cattle

population but may be transmitted to man if undetected during inspection. Despite a low frequency of occurrence, the nature of this disease dictates that different techniques be utilized in order to gather sufficient data before a recommendation is made to eliminate the incision of the medial masticatory muscles.

The task force recommended that the new procedure, modified to include the incision of the medial masticatory muscles, be implemented for cows and bulls. In addition, it was recommended that the current Acceptable Quality Level (AQL) program for beef carcasses be modified for use in conjunction with the new procedure. A reinspection program for beef tongues was also deemed necessary in order to monitor the effectiveness of the plant employee's palpation of the beef tongues. Further work measurement studies will be conducted to establish staffing standards for plants with one and two inspectors (i.e., those plants currently operating at rates less than 57 head per hour).

APPENDIX A
TRAINING TASK ANALYSIS

While the test study was being conducted, a Training Division Officer performed a detailed task analysis of the proposed inspection procedures. The task analysis, which described the work to be done in performance terms, is a critical step in the development of any training endeavor. It enables the trainer to describe training objectives and to determine the most appropriate instructional setting to accomplish these objectives. The task analysis may be used to develop self-instructional lessons or guides that are sufficiently explanatory so that all trainees can correctly perform the assigned tasks as required by the program. The production of any self-instructional materials requires the prior approval of job requirements that are derived from an accurate, approved task analysis. The following are the estimated job requirements for both the food inspector and the veterinary medical officer.

Assigned to an establishment using approved post-mortem inspection procedures, the veterinary medical officer will be able to:

1. Identify the facility requirements of the approved procedures, the optimum line speeds allowed, and other limits within the approval for the revised procedures.
2. Tell inspectors what the measurable standards are in the approval for that facility (line speeds and other limits), and provide them with the proper corrective

action to take when these are not met.

3. In measurable terms, tell the inspectors what the operational sanitation requirements are for each of the inspection stations, and provide them with the proper corrective actions to take when these are not met.
4. In measurable terms, tell the inspectors what the product presentation standards are for each inspection station, and provide them with the proper corrective actions to take when these are not met.
5. In measurable terms, tell the inspector at each of the inspection stations what is required of him/her at that inspection station. Explain to each what the standards are for doing an acceptable job, and provide feedback for meeting and maintaining this level.
6. Identify the critical elements of the job that would indicate the inspection procedures are not being carried out with satisfactory results. Check for product that has been condemned, yet meets minimum MPI requirements and for product passed for human food that should have been either condemned or retained for veterinary disposition. Tell the inspector what the standards are and provide feedback for meeting and maintaining them.
7. Observe the dressing procedures being used by the establishment. Identify any area where controls are needed to assure that the product is not adulterated.

Tell the inspectors what the standards are for these controls and provide them with the proper corrective action expected. Provide feedback for meeting and maintaining them.

8. Observe the plant trimming operations at the inspection stations. Tell inspectors what corrective action should be taken if trimmers are not trimming correctly.
9. Recognize disease and abnormal conditions that indicate that the carcass does not meet the minimum MPI requirements for human food, and make proper disposition of wholesome carcasses based on current MPI disposition criteria.
10. Inform plant management of the standards that the establishment must meet under the approved new inspection procedures so that the carcasses meet minimum product requirements.

A food inspector assigned to a post-mortem inspection station using the new procedures will be able to:

1. Determine when the facilities and minimum station requirements are not being met, and take the proper corrective action.
2. Determine when minimum standards for operational sanitation are not being met, and take the proper corrective action.

3. Determine when minimum standards for product presentation for inspection are not being met, and take the proper corrective action.
4. Conduct post-mortem inspection at the inspection stations in a way that cattle, or parts thereof, are properly condemned, retained or passed.
5. Direct work of the plant trimmer to assure that minimum MPI requirements are met.

APPENDIX B
Calculation of Inspection Rate Standard

OBJECTIVE

To establish MPI inspection line staffing requirements for the new cattle post-mortem inspection procedure.

SCOPE

Work measurement standards are used to establish inspection staffing rates for cows and bulls in plants with a mechanized viscera table and tongue-out presentation of the heads. Inspection is to be accomplished by staffing slaughter lines with three or more inspectors.

APPROACH

Development of the work measurement standards requires two stages: (1) the preliminary standard and (2) the final standard.

Preliminary Standard

The preliminary standard was developed utilizing various industrial engineering and mathematical techniques. The number of head and viscera/carcass inspectors were calculated based on the various slaughter rates as are shown in Table 4.

Final Standard

For the development of the final standard this is the procedure that would be used as recommended by the Industrial Engineering and Data Management Division (IEDM).

METHODOLOGIES

Direct time studies using extensive Industrial Engineering work measurement methods will be used in establishing the standard.

Selecting Plants

The Slaughter Inspection Standards and Procedures Division (SISP) will select different cow/bull plant establishments based on various slaughter rates (cattle per hour) for the purpose of establishing the final work measurement standard.

Collecting Work Measurement Data

Action of inspectors properly performing the proposed inspection procedure at the head and viscera/carcass inspection stations under actual operating conditions will be filmed by work measurement personnel using a video camera. Both before and during the study, the inspection operations will be closely monitored by the project director to assure that the inspectors were performing the new procedure correctly and that the units to be inspected were presented properly.

Analyzing Work Measurement Data

Work measurement data for each inspection cycle will be collected and analyzed to determine the amount of time required for each work element in the cycle. The work elements will be separated and divided into distinct operations within the inspection cycle. For example, the head inspection cycle will consist of the following work elements: reach for and hook the head on the leading side, inspect leading side, dehook leading side and hook the lagging side, inspect lagging side, dehook, inspect tongue, and condemn head, steel knife, and sterilize knife when required. The work elements that did not occur in each work cycle will be pro-rated depending on how often they occurred. Data on the frequency of these elements will be provided by SISP. The time spent for each work element will then be adjusted according to the pace of each inspector. The adjusted time for each inspector will then be used to establish the work times for each inspection cycle.

Rating

The performance of inspectors will be adjusted by a process called pace rating. This adjustment involves judging the pace at which an inspector performs a task in relation to a normal pace. FSIS staff members were given thorough training in pace rating. They were trained to recognize the normal pace and to judge an inspector's observed pace in relationship to the normal pace. For the work measurement standards, the inspector's pace will be rated.

After pace rating, a difficulty adjustment for performing a particular task will be added to adjust the inspection cycle time. Difficulty adjustment values will be obtained from a standard engineering table. Work elements such as handwashing and knife steeling will also be added to the inspection cycle time.

Determining the Optimum Inspection Task Combinations

After the time values of each work element were determined, the work elements will be combined to achieve an equalized workload among inspectors at different inspection levels. For example, when two inspectors are required to perform the viscera and carcass inspection, the total inspection workload will be equally shared by the two inspectors. One inspector will perform the pluck, kidney and exterior carcass inspection while another inspector will perform liver, viscera and inside carcass inspection. The same approach can be applied to inspection stations where more inspectors are required.

Calculating the Maximum Inspection Rate

A maximum inspection rate will then be calculated based on each inspector's workload and the following criteria:

- a. At no time would an inspector's workload exceed 125%
- b. An average of 100% workload per inspector per shift will not be exceeded.

- c. Inspectors will be rotated among the inspection stations during each shift so that each inspector would have an equal workload.

The staffing table, based on the work measurement standards, will be used to determine the number of inspectors that should be assigned to each inspection station.

(TABLE 4)

NEW CATTLE INSPECTION SYSTEM

Preliminary Staffing Standards for Cows and Bulls
Post-Mortem Inspection*

(3 Inspectors or more)

<u>Maximum Inspection Rates (Head/Hour)</u>		<u>Number of Inspectors - By Stations</u>	<u>Total of Number of Inspectors</u>
	<u>Head</u>	<u>Viscera/Carcass</u>	
** 57 to 133	1	2	3
134 to 169	2	2	4
170 to 218	2	3	5
219 to 268	2	4	6

* A uniform presentation by the plant that is acceptable to the inspector in charge is essential to maintain the specified inspection rate.

** The 57 head per hour is based on the traditional inspection standard published in the Federal Register, Vol. 47, No. 150, August 4, 1982.

Maximum inspection rates for multiple inspector lines are based on inspectors rotating through the different types of inspection stations during each shift to equalize the workload.

APPENDIX C

CATTLE POST-MORTEM INSPECTION PROCEDURES

TRADITIONAL	NEW
<p>A. Head Inspection</p> <ol style="list-style-type: none"> 1. Incise lymph nodes attached to the tongue -- supra-pharyngeal, atlantal, mandibular. 2. Observe and palpate tongue. 3. Observe head's surfaces and and eyes. 4. Incise and observe parotid lymph nodes, lateral and medial masticatory muscles. 	<p>A. Head Inspection</p> <ol style="list-style-type: none"> 1. Incise lymph nodes attached to tongue -- suprapharyngeal, mandibular. 2. Observe tongue. 3. Observe head's surfaces and eyes. 4. Incise and observe parotid lymph nodes and lateral masticatory muscles.
<p>B. Viscera Inspection</p> <ol style="list-style-type: none"> 1. Observe eviscerated carcass. 2. Observe mesenteric lymph nodes and abdominal viscera. 3. Observe and palpate ruminoreticular junction. 4. Observe esophagus and spleen. 5. Incise and observe lungs' lymph nodes--mediastinal (posterior, middle, anterior) and bronchial (right and left). 6. Observe and palpate costal (curved) surfaces of lungs. 7. Incise heart, from base to apex or vice versa, through interventricular septum, and observe cut and inner surfaces. 8. Turn lungs over; observe ventral flat surfaces and heart's outer surface. 9. Incise and observe hepatic (portal) lymph nodes. 10. Open bile duct (both directions), and observe its content. 11. Observe and palpate liver's ventral surface. 12. Turn liver over, palpate renal impression, observe and palpate parietal (dorsal) surface. 	<p>B. Viscera/Carcass Inspection</p> <ol style="list-style-type: none"> 1. Observe outer surfaces of eviscerated carcass including dorsal surface (with the use of the mirror), and observe the superficial inguinal (supramammary) lymph nodes. 2. Observe the pelvic and peritoneal cavities and the diaphragm. 3. Observe pleural cavity and cut surfaces of muscles and bones. 4. Observe mesenteric lymph nodes and abdominal viscera. 5. Observe ruminoreticular junction. 6. Observe esophagus and spleen. 7. Incise and observe lungs' lymph nodes -- mediastinal (posterior, middle, anterior) and left bronchial. 8. Observe and palpate costal (curved) surfaces of lungs. 9. Observe outer surface of heart, then incise heart, from base to apex or vice versa through interventricular septum, and observe cut and inner surfaces.
<p>C. Carcass Inspection</p> <ol style="list-style-type: none"> 1. Palpate superficial inguinal, or supramammary, and internal iliac lymph nodes. 2. Observe lumbar region. 3. Observe and palpate kidneys'. 4. Observe diaphragm's pillars and peritoneum. 5. Observe and palpate diaphragm. 6. Observe pleura, cut surfaces of muscles and bones, neck, and carcass exterior. 	<ol style="list-style-type: none"> 10. Observe hepatic (portal) lymph nodes. 11. Open bile duct (both directions), and observe its content. 12. Observe and palpate liver's ventral surface. 13. Turn liver over, palpate renal impression; observe and palpate parietal (dorsal) surface. 14. Observe all surfaces of the kidneys.

APPENDIX D
INSTRUCTION FOR USE OF WORKSHEETS

These forms are worksheets, and therefore, it is not necessary to prepare copies.

The worksheets are designed according to the functions involved at the head, viscera, and carcass (head and viscera/carcass for proposed procedures) inspection stations and are intended to be used for recording data necessary to test and analyze the feasibility of new cattle post-mortem inspection procedures. Use each sheet for 100 evaluations.

Worksheets No. 1 through No. 6 are to be used for traditional and new procedures at five evaluation sites.

Each worksheet has categories, and some have subcategories. For each, the information recorded should show (1) tallied units examined, (2) tallied and total units with errors, and (3) total errors.

Evaluation of the two procedures is to be accomplished at five sites: head and tongue immediately after head and tongue inspection; viscera and livers both, immediately after viscera inspection; viscera/carcass after viscera inspection; and carcass after carcass inspection and dressing.

The project officer in charge should determine where, when, and how the units can be selected, notify the inspector in

charge, the inspectors, and plant representative, and instruct the evaluators.

As instructed, examine 100 units for each procedure. The units should be selected as randomly as possible throughout the day's operation.

One unit is represented by a head at the head station, a tongue at the head station, a set of viscera or liver at the viscera station, a carcass at the viscera station, and both sides of a carcass at the carcass station.

The numbers 1-15 across the top of the page do not indicate the first, second, etc., heads (tongue, carcass, viscera) evaluated; they specify only those heads (tongues, carcass, viscera) found with errors. For example, the first head (tongue, carcass, viscera) found with errors is recorded on the appropriate line in column 1, the second one in column 2, etc. Tally each unit examined by placing a slash in each of the 100 circles at the top of each sheet to keep track of how many have been evaluated. If one unit does not have an error, or if no error is noted for a category or subcategory while one unit is inspected by inspection personnel, enter one tally in the units examined space. Score under pathology or dressing errors, only those heads (tongues, carcasses, viscera) with errors. If one or more errors are noted in one unit, tally them in the appropriate space next to the category or subcategory, i.e., if a head (tongue, carcass, viscera) has several errors, score them all in

the same column. If several errors are of the same type, indicate the number in the appropriate box. For example, if the first head with errors has one abscess lesion and two contamination errors, in column 1 score a 1 beside abscess and a 2 beside contamination.

Some categories, such as hair, have definite guidelines spelled out; others, such as contamination (feces, urine, ingesta, oil, and grease), etc., have not. Tally them when the error is of sufficient extent that correction would have been called for if it had been recognized at the point of inspection (head, viscera, carcass station).

Where listed, the category "other" is to score or identify errors that may not be scored under other categories or subcategories or to identify an error which may be considered a particular problem.

Evaluators are to sign each sheet. The project officer in charge is to sign each sheet after checking all entries and computing the row totals.

All testing and evaluating procedures should be done without causing disruption of plant operations.

Instructions for Use of Each Worksheet:

Worksheet No. 1

1. Abscess/Acti -- retain unit (head and carcass).
2. Eosinophilic Myostis/Cysticercosis -- retain unit (head and carcass)
3. Bruises -- score those 2 inches or more in length or one inch or more deep.
4. Hair -- score those patches with 10 or more hairs in an area the longest dimension of which is 5 inches or less.
5. Oil/grease -- score spots of any amount.
6. Lymph node (s) missing -- do not count unit.
- .
7. Lymph node(s) not incised -- do not count unit.

Worksheet No. 2

1. If tongue is missing, tally unit as acceptable.

Worksheet No. 3

1. Septicemia/Toxemia -- tally under "other pathology," and enter under "remarks".
2. Specific disease (diagnosis made) -- tally under "other pathology," and enter under "remarks".
3. Lungs -- consider both lungs as one unit.
4. Kidneys -- consider both kidneys as one unit.
5. One kidney with two abscesses, one with three cysts -- tally as one unit with two abscesses and three cysts.

Worksheet No. 4

1. Multiple liver abscesses -- estimate number of abscesses.

Worksheet No. 5

1. Tally diseases or conditions requiring veterinary disposition.
2. Tally under "other" any condition which would cause contamination if not removed.

Worksheet No. 6

1. Peritoneum or pleura -- consider both sides as one unit (carcass is split).
2. Adhesions/bruises -- tally those 2 inches or more in diameter. Also tally bruises 1 inch deep regardless of length.
3. Incompleted trimming -- tally unit; specify organ involved under "remarks."

NOTE:

1. Unit (head, tongue, viscera, carcass) retained by evaluator -- tally in appropriate or "other" space, and specify under "remarks."
2. Take adequate time (skip units if required) to evaluate units thoroughly.
3. When less than 100 units are tallied on one test, circle the partially completed tally section.
4. If more than 15-17 units with errors are found on one test, use a second sheet and circle the partially completed tally section(s).

- 5. When neoplasms are identified by the evaluator, laboratory confirmation should be obtained.

Remarks (if additional space needed use reverse)

Signature(s) of Evaluator(s)	Signature of Project OIC
A. B. C.	

Appendix E

WORKSHEET No. 2		Est. No.	Locations (City, State)	Chainspeed	Procedure	No. of Inspectors	Date								
		CATTLE			<input type="checkbox"/> Current										
		TONGUE INSPECTION			<input type="checkbox"/> Proposed										
Units Examined (Tally Each Unit)															
<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/> 13 <input type="checkbox"/> 14 <input type="checkbox"/> 15		<input type="checkbox"/> 16 <input type="checkbox"/> 17 <input type="checkbox"/> 18 <input type="checkbox"/> 19 <input type="checkbox"/> 20 <input type="checkbox"/> 21 <input type="checkbox"/> 22 <input type="checkbox"/> 23 <input type="checkbox"/> 24 <input type="checkbox"/> 25 <input type="checkbox"/> 26 <input type="checkbox"/> 27 <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 31 <input type="checkbox"/> 32 <input type="checkbox"/> 33 <input type="checkbox"/> 34 <input type="checkbox"/> 35 <input type="checkbox"/> 36 <input type="checkbox"/> 37 <input type="checkbox"/> 38 <input type="checkbox"/> 39 <input type="checkbox"/> 40 <input type="checkbox"/> 41 <input type="checkbox"/> 42 <input type="checkbox"/> 43 <input type="checkbox"/> 44 <input type="checkbox"/> 45 <input type="checkbox"/> 46 <input type="checkbox"/> 47 <input type="checkbox"/> 48 <input type="checkbox"/> 49 <input type="checkbox"/> 50 <input type="checkbox"/> 51 <input type="checkbox"/> 52 <input type="checkbox"/> 53 <input type="checkbox"/> 54 <input type="checkbox"/> 55 <input type="checkbox"/> 56 <input type="checkbox"/> 57 <input type="checkbox"/> 58 <input type="checkbox"/> 59 <input type="checkbox"/> 60 <input type="checkbox"/> 61 <input type="checkbox"/> 62 <input type="checkbox"/> 63 <input type="checkbox"/> 64 <input type="checkbox"/> 65 <input type="checkbox"/> 66 <input type="checkbox"/> 67 <input type="checkbox"/> 68 <input type="checkbox"/> 69 <input type="checkbox"/> 70 <input type="checkbox"/> 71 <input type="checkbox"/> 72 <input type="checkbox"/> 73 <input type="checkbox"/> 74 <input type="checkbox"/> 75 <input type="checkbox"/> 76 <input type="checkbox"/> 77 <input type="checkbox"/> 78 <input type="checkbox"/> 79 <input type="checkbox"/> 80 <input type="checkbox"/> 81 <input type="checkbox"/> 82 <input type="checkbox"/> 83 <input type="checkbox"/> 84 <input type="checkbox"/> 85 <input type="checkbox"/> 86 <input type="checkbox"/> 87 <input type="checkbox"/> 88 <input type="checkbox"/> 89 <input type="checkbox"/> 90 <input type="checkbox"/> 91 <input type="checkbox"/> 92 <input type="checkbox"/> 93 <input type="checkbox"/> 94 <input type="checkbox"/> 95 <input type="checkbox"/> 96 <input type="checkbox"/> 97 <input type="checkbox"/> 98 <input type="checkbox"/> 99 <input type="checkbox"/> 100													
Category-Subcategory															
Units with Errors															
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Total															
PATHOLOGY	Lymph Nodes	1. Abscess													
		2. Acti													
		3. Other (specify)													
	4. Lacerations														
	5. Scars														
	6. Abscess														
7. Acti															
8. Ulcers															
9. Hair sores															
10. Cactus thorns															
11. Other pathology (specify)															
ERRORS	12. Ingesta														
	13. Stain														
	14. Other dressing errors (specify)														
Remarks (if additional space needed use reverse)															

Signature(s) of Evaluator(s)			Signature of Project OIC	
A.	B.	C.		

Appendix E

WORKSHEET No. 3 CATTLE VISCERA-VISCERA INSPECTION	Est. No.	Location(City,State)	Chainspeed	Procedure <input type="checkbox"/> Current <input type="checkbox"/> Proposed	No. of Inspectors	Date
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Units Examined (Tally Each Unit)

1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 30	41 42 43 44 45	46 47 48 49 40	51 52 53 54 55	56 57 58 59 50	61 62 63 64 65	66 67 68 69 60	71 72 73 74 75	76 77 78 79 70	81 82 83 84 85
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Category		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
PATHOLOGY	Heart	1. Parasitic															
		2. Pigmentary															
		3. Pericarditis															
		4. Endocarditis															
		5. Adhesions															
		6. Other (specify)															
Kidney		Nephritis- 7. Pyelitis															
		8. Cysts															
		9. Abscess															
		10. Neoplasms															
		11. Other (specify)															
		12. Pneumonia															
Lungs		13. Pleuritis															
		14. Abscess															
		15. Neoplasm															
		16. Other (specify)															
		17. Spleen (specify)															
		18. Enteritis															
DRESS ERRORS		19. Ruminio-reticular															
		20. Metritis															
		21. Other (specify)															
		Other Pathology 22. (specify)															
		23. Contamination															
		Other Dressing Errors 24. (specify)															

Remarks (use reverse)

Appendix E

WORKSHEET No. 4 CATTLE LIVER INSPECTION		Est. No.	Location(City,State)	Chainspeed	Procedure Current Proposed	No. of Inspectors	Date											
Units Examined (Tally Each Unit)																		
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 40											
6 1 8 9 10	7 2 11 12 13	14 15 16 17 18	19 20 21 22 23	24 25 26 27 28	29 30 31 32 33	34 35 36 37 38	39 40 41 42 43											
11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 30	31 32 33 34 35	36 37 38 39 40											
PATHOLOGY		Category	Units with Errors													Total		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		1. Abscess																
		2. Carotenosis																
		3. Cirrhosis																
		4. Distoma																
		5. Sawdust																
		6. Telangiectasis																
		7. Other (specify)																
		DRESSING ERRORS	8. Fecal															
Kidney	9. Other (specify)																	
10. Nephritis-pyelitis																		
11. Cysts																		
12. Abscesses																		
13. Neoplasms																		
14. Other (specify)																		

Remarks (if additional space needed use reverse)

Signature(s) of Evaluator(s)			Signature of Project OIC	
A.	B.	C.		

Appendix E

WORKSHEET No. 5 CATTLE VISERA-CARCASS INSPECTION	Est. No.	Location(City,State)	Chainspeed	Procedure Current Proposed	No. of Inspectors	Date
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Units Examined (Tally Each Unit)

1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 40	41 42 43 44 45	46 47 48 49 50	51 52 53 54 55	56 57 58 59 60	61 62 63 64 65
6 7 8 9 10	1 2 3 4 5	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 40	41 42 43 44 45	46 47 48 49 50	51 52 53 54 55	56 57 58 59 60	61 62 63 64 65
11 12 13 14 15	6 7 8 9 10	1 2 3 4 5	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 40	41 42 43 44 45	46 47 48 49 50	51 52 53 54 55	56 57 58 59 60	61 62 63 64 65

PATHOLOGY	Category - Subcategory	Units with Errors															Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	1. Neoplasm																
	2. Emaciation																
	3. Injection lesions																
	Parasitic Conditions																
	4. (except grubs)																
	Pigmentary Conditions																
	5. (specify)																
	6. Injury																
	7. Adhesions (excessive)																
	8. Contamination (pathologic)																
	9. Peritonitis																
	10. Pleuritis																
	11. Other (specify)																
DRESSING ERRORS	12. Feces-ingesta																
	13. Grubs																
	14. Urine																
	15. Bile																
	16. Visceral parts																
	17. Other Dressing Errors (specify)																

Remarks (if additional space needed use reverse)

Signature(s) of Evaluator(s)			Signature of Project OIC
A.	B.	C.	

Appendix E

WORKSHEET No. 6 CATTLE CARCASS INSPECTION	Est. No.	Location (City, State)	Chainspeed	Procedure <input type="checkbox"/> Current <input type="checkbox"/> Proposed	No. of Inspectors	Date
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Units Examined (Tally Each Unit)

1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35

		Units with Errors															Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PATHOLOGY	1. Arthritis																
	2. Neoplasm																
	3. Abscess																
	4. Contamination (Pathologic)																
	Pigmentary Conditions																
	5. (specify)																
	6. Injury																
	Bruise (More than 7. 2" long or 1" deep)																
	8. Peritonitis																
	9. Pleuritis																
	10. Adhesions																
	11. Emaciation																
12. Other Pathology (specify)																	
DRESSING ERRORS	13. Hair (10 or more hairs in an area 5" long or less)																
	14. Fecal																
	15. Hide																
	16. Bile																
	17. Extraneous Material (Oil, Grease, Rust, etc.)																
	18. Visceral Parts																
	19. Other Dressing Errors (specify)																
Kidney	20. Nephritis-pyelitis																
	21. Cysts																
	22. Abscesses																
	23. Neoplasms																
	24. Other (specify)																

Remarks (if additional space needed use reverse)

A.	Signature(s) of Evaluator(s)			Signature of Project OIC		
	B.		C.			

Appendix F - Inspection Stations and Evaluation Sites: Mechanized Plant

ILLUSTRATION 1 - Head and Tongue Evaluation



I_c I_p
Head
Inspection
Station

$E_1 E_2$
 E_3
Evaluation Site #1

KEY

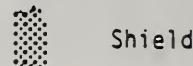
I_c = Inspector using traditional procedures

I_p = Inspector using new procedures

E_1 = Evaluator #1 E_3 = Evaluator
 E_2 = Evaluator #2 E_3 (Recorder)



Set of Viscera



Shield



Carcasses



Heads and Tongues

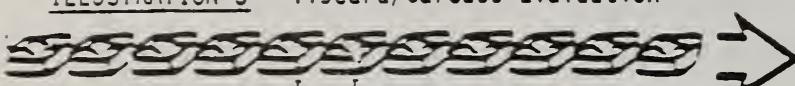
ILLUSTRATION 2 - Viscera and Liver Evaluation



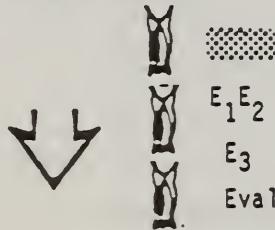
I_c I_p
Viscera Inspection
Station

$E_1 E_2$
 E_3
Evaluation Site #2

ILLUSTRATION 3 - Viscera/Carcass Evaluation



I_c I_p
Viscera Inspection Station



$E_1 E_2$
 E_3
Evaluation Site #3

ILLUSTRATION 4 - Carcass Evaluation



I_c-p
Carcass Inspection
Station*

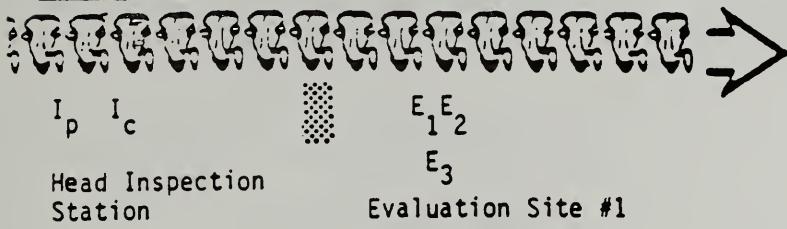
$E_1 E_2$
 E_3
Evaluation Site #4

During carcass evaluation the setup of the inspectors at the viscera station will be the same as for viscera evaluation.

*Carcass inspectors will perform traditional procedures on carcasses marked with the traditional procedure code but will perform no inspection on those marked with the proposed inspection code.

Appendix F - Inspection Stations and Evaluation Sites: Mechanized Plant

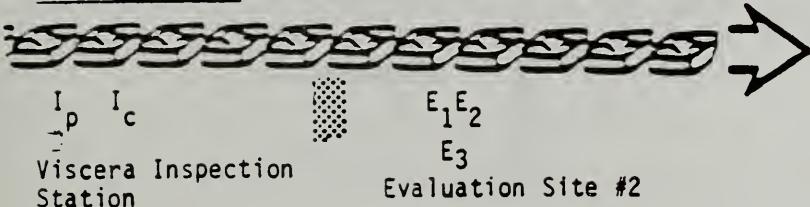
ILLUSTRATION 1 - Head and Tongue Evaluation



KEY

I_c = Inspector using traditional procedures
 I_p = Inspector using new procedures
 E_1 = Evaluator #1
 E_2 = Evaluator #2 E_3 = Evaluator #3
 Set of Viscera

ILLUSTRATION 2 - Viscera Evaluation



Shield
 Carcasses
 Heads and Tongues

ILLUSTRATION 3 - Viscera/Carcass Evaluation

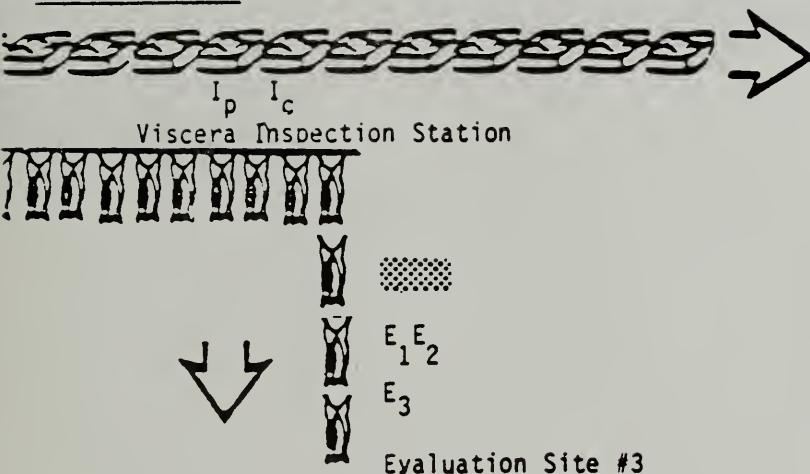
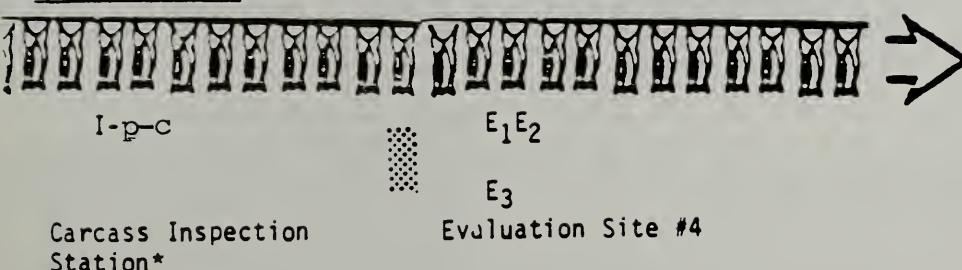


ILLUSTRATION 4 - Carcass Evaluation

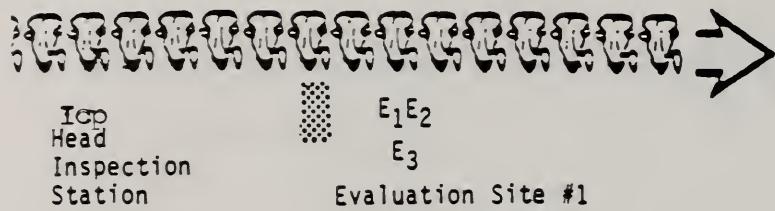


During carcass evaluation the setup of the inspectors at the viscera station will be the same as for viscera evaluation.

*Carcass inspectors will perform traditional procedures on carcasses marked with the traditional procedure code but will perform no inspection on those marked with the new inspection code.

Appendix F - Inspection Stations and Evaluation Sites: Non-mechanized Plant

ILLUSTRATION 1 - Head and Tongue Evaluation

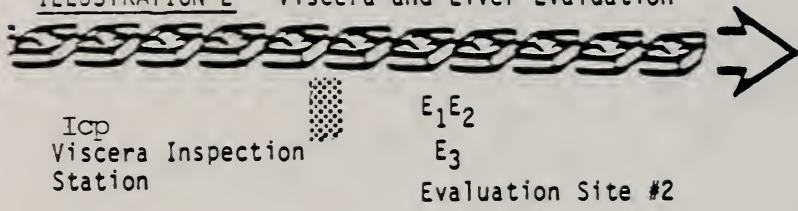


KEY

Icp* Inspector alternating between new and traditional procedures

E₁ = Evaluator #1 E₃ = Evaluator
E₂ = Evaluator #2 (Recorder)

ILLUSTRATION 2 - Viscera and Liver Evaluation



Set of Viscera



Shield



Carcasses

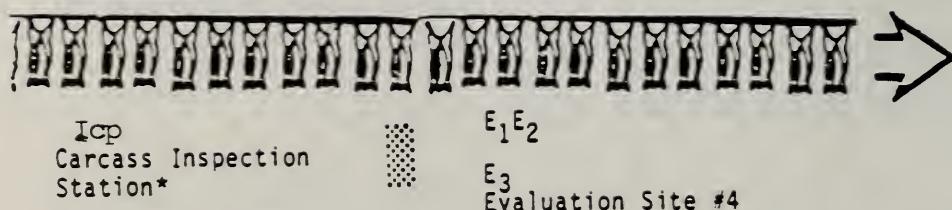


Heads and Tongues

ILLUSTRATION 3 - Viscera/Carcass Evaluation



ILLUSTRATION 4 - Carcass Evaluation



During carcass evaluation the setup of the inspectors at the viscera station will be the same as for viscera evaluation.

*Carcass inspectors will perform traditional procedures on carcasses marked with the traditional procedure code but will perform no inspection on those marked with the proposed inspection code.

Appendix F - Inspection Stations and Evaluation Sites: Non-mechanized Plant

ILLUSTRATION 1 - Head and Tongue Evaluation



Ipc

Head Inspection
Station



E₁ E₂

E₃

Evaluation Site #1

KEY

Ipc = Inspector alternating between new and traditional procedures

E₁ = Evaluator #1

E₂ = Evaluator #2 E₃ = Evaluator #3



Set of Viscera



Shield



Carcasses



Heads and Tongues

ILLUSTRATION 2 - Viscera Evaluation



Ipc

Viscera Inspection
Station

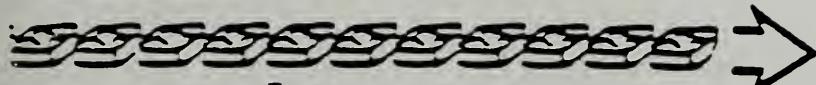


E₁ E₂

E₃

Evaluation Site #2

ILLUSTRATION 3 - Viscera/Carcass Evaluation



Ipc

Viscera Inspection Station



E₁ E₂
E₃

Evaluation Site #3

ILLUSTRATION 4 - Carcass Evaluation



Ipc

Carcass Inspection
Station*



E₁ E₂

E₃

Evaluation Site #4

During carcass evaluation the setup of the inspectors at the viscera station will be the same as for viscera evaluation.

*Carcass inspectors will perform traditional procedures on carcasses marked with the traditional procedure code but will perform no inspection on those marked with the new inspection code.

